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II. *Observations on the diurnal variation of the magnetic needle, at the Whale Fish Islands, Davis's Strait. By Lieutenant HENRY FOSTER, R. N. F. R. S.*

PREVIOUS to leaving England in the spring of 1824, I had determined upon making a series of observations on the daily variation of the magnetic needle, during our stay, at the different places which might be visited by the Expedition. Accordingly, soon after our arrival at the Whale Fish Islands, for the purpose of transshipping the stores from the Transport which had accompanied us thus far ; the instrument for observing the diurnal variation was landed, and placed on a pedestal in a small octagonal observatory.

The length of the needle was 11 inches, and weighed 120 grains ; it rested on a pivot ; and its direction when the *sun* was on the magnetic meridian I assumed, for distinction's sake, the zero of my scale. The observations were continued for three days only ; and as the brass work of the instrument was afterwards found to be magnetic, the results obtained are, of course, too doubtful to be considered of any great value taken singly ; but as it was these observations which first indicated to me the agency of the *sun*, in producing the interesting phenomenon of the daily variation, I have thought it right to give them in detail, together with such remarks as occurred to me at this early stage of the enquiry, as preliminary to the more extended and exact observations made at Port Bowen by Captain PARRY, the other Officers of the Expedition, and myself, an account of which accompanies this communication to the Royal Society.

*Lieutenant FOSTER's observations, &c.*

Observations on the daily variation of the magnetic needle at the Whale Fish Islands, June 1824. Variation 70° 2' W.													
June 29th. Instrument adjusted when ☉ was on mag <sup>t</sup> . meridian.						June 30th. Instrument re-adjusted when ☉ was on mag <sup>t</sup> . meridian.							
Apparent Time of Ob- servation.	Temperature.		Baro- meter.	Reading of south end of needle.	Direction of south end of needle.	Remarks, &c.	Apparent Time of Ob- servation.	Temperature.		Baro- meter.	Reading of south end of needle.	Direction of south end of needle.	Remarks, &c.
	Inst.	Air.						Inst.	Air.				
h. m.	+	+	inches.	° ' "			h. m.	+	+	inches.	° ' "		
A. M. 7 35	49	45		4 14 00	} South end of nee- dle going to the eastward.	☉ on magnetic meridian.	A. M. 7 30	52	46		4 10 30	} South end of the needle drawn to the eastward.	☉ on magnetic meridian.
10 10	55	45	30,00	20 15			10 10	53	46	29,94	7 30		
11 10	56 <sup>1</sup> / <sub>2</sub>	45	.....	20 15			11 10	53	47	.....	26 30		
P. M. 12 10	56 <sup>3</sup> / <sub>4</sub>	45	.....	22 00	} South end going to the westward.	15' max. westerly variation. ☉ west by compass.	P. M. 12 10	53	47	.....	29 30	} South end of needle going to the westward.	23' max. westerly variation. ☉ west by compass. Cloudy weather.
1 10	57	45	.....	29 00			1 20	53 <sup>1</sup> / <sub>2</sub>	47	.....	30 30		
2 10	56	47	.....	23 00			2 20	54	47	.....	24 00		
3 10	56	47	30,02	19 30	} Needle unsettled.	☉ on mag. meridian.	3 10	56	47	29,91	20 00	} SSE wind with rain.	
4 10	57	47	.....	21 00			4 10	55	46	.....	9 00		
5 10	58	46	.....	21 00									
6 47	65	45	.....	19 00	} Light airs and fine weather.		6 46	56 <sup>1</sup> / <sub>2</sub>	45	.....	12 00		
7 10	57	44	.....	19 00			7 10	54	44	.....	8 30		
8 10	56	42	.....	19 00			8 10	49	43 <sup>1</sup> / <sub>2</sub>	.....	9 30		
9 10	57	41	30,00	13 00	} Needle unsettled.		9 10	49	43	29,98	13 00		
10 10	56	41	.....	17 00			10 10	46	42	.....	9 30		
11 10	47	40	.....	19 00			11 10	43 <sup>1</sup> / <sub>2</sub>	42	.....	9 30		
Mid <sup>t</sup> 12 10	45 <sup>1</sup> / <sub>2</sub>	40	.....	17 00			Mid. 12 10	42	41 <sup>1</sup> / <sub>2</sub>	.....	9 30		

July 1st.						
Apparent Time of Ob- servation.	Temperature.		Baro- meter.	Reading of south end of needle.	Direction of south end of needle.	Remarks, &c.
	Inst.	Air.				
h. m.	+	+	inches.	° ' "		
A. M. 7 30	44	42 $\frac{1}{2}$		4 10 00	} S. end to South end of the west-needle drawn ward.	☉ on mag. mer.  23' 30'' max. W. var. ☉ west by compass.
10 30	42	39	29,97	8 30		
11 10	43	39	.....	12 30		
P. M. 12 10	43	39	.....	10 00		
1 10	44	40	.....	23 30		
2 10	45	40	.....	8 00		
3 10	46	44	29,98	00 00		
Here the observations were interrupted by the re-shipment of the instruments preparatory to the departure of the expedition.						

From these observations it appears, that the maximum westerly variation happened about a quarter past one o'clock P. M. at which time the sun was nearly west by compass. The observations, however, were not continued after midnight; consequently the time of maximum easterly could not be determined, nor the total amount of the daily variation.